

DR. GREG TORDA

gergely.torda@my.jcu.edu.au

PhD

2009 to 2013

School of Marine and Tropical Biology

Sponsored by AIMS@JCU project fund

Supervised by:

Prof. Bette Willis (JCU)

Dr. Madeleine van Oppen (AIMS)

Dr. Petra Lundgren (AIMS)

Genetic assessment of population structure and the origin of recruits in brooding corals: understanding population connectivity on the Great Barrier Reef on various timescales

Greg is originally from Hungary, where he worked as a junior researcher with the Hungarian Academy of Sciences. He completed his MSc in Zoology at Szent Istvan University, Hungary and completed a 2-year postgraduate program in marine ecology at the University of Las Palmas de Gran Canaria, Spain. Greg's early research focused on behavioural ecology of birds and marine mammals, before specialising in GIS applications in landscape ecology, including studies on habitat connectivity and the development and application of ecologically scaled landscape indices.

Coral reefs are inherently fragmented ecosystems in which connectivity of coral sub-populations is maintained through larval dispersal. The distance to which ecologically significant numbers of larvae can disperse is an important parameter for conservation management when designing networks of marine protected areas. However, this information is largely absent for reef corals due to difficulties in direct tracking larval dispersal. Greg's research is the first to use modern population genetic tools to estimate contemporary larval dispersal of scleractinian corals by genetically assigning new recruits to potential source populations.

Greg's PhD aimed to estimate the ecological connectivity and its temporal stochasticity for two common pocilloporid coral species on the GBR, *Seriatopora hystrix* and *Pocillopora damicornis*, by genetically characterizing new recruits at a number of locations in Palm and Lizard Islands and comparing these with the genetic characteristics of adult populations at a wider range of populations.

Greg's research found both high genetic similarities over large spatial scales and high genetic differentiation at local spatial scales among populations of *P. damicornis* Type α and β . Long pelagic larval duration (PLD) combined with strong longshore currents along the GBR can explain the similarity among populations hundreds of kilometres apart. Differentiation among neighbouring populations is a signature of more recent single recruitment events from genetically distinct sources combined with the spatially and temporally stochastic nature of recruitment. He found no evidence for predominantly clonal reproduction within populations, despite the large energy allocation of asexually produced brooded larvae.



Publications

Czúcz, B. & Torda, G., 2009. A spatially explicit, indicator-based methodology for quantifying the vulnerability and adaptability of natural ecosystems. , pp.209 – 227.

Hazevoet, C.J. et al., 2010. Recent data on whales and dolphins (Mammalia : Cetacea) from the Cape Verde Islands , including records of four taxa new to the archipelago., 1(2), pp.75–99.

Lukoschek, V. et al., 2013. The importance of coral larval recruitment for the recovery of reefs impacted by cyclone Yasi in the central Great Barrier Reef. *PloS one*, 8(6), p.e65363. Available at: <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=3673992&tool=pmcentrez&rendertype=abstract>.

Torda, G. et al., 2013. A rapid genetic assay for the identification of the most common *Pocillopora damicornis* genetic lineages on the Great Barrier Reef. *PloS one*, 8(3), p.e58447. Available at: <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=3591320&tool=pmcentrez&rendertype=abstract>.

Torda, G., 2012. Connecting the dots: stepping stones for coral reef conservation. In *3MT thesis competition. AIMS winner, JCU finalist*.

Torda, G. et al., 2013a. Genetic assignment of recruits reveals short- and long-distance larval dispersal in *Pocillopora damicornis* on the Great Barrier Reef. *Molecular ecology*, 22(23), pp.5821–34. Available at: <http://www.ncbi.nlm.nih.gov/pubmed/24112610>

Torda, G. et al., 2013b. Revisiting the connectivity puzzle of the common coral *Pocillopora damicornis*. *Molecular ecology*, 22(23), pp.5805–20. Available at: <http://www.ncbi.nlm.nih.gov/pubmed/24112642>

Torda, G., Suárez, P.L. & Jurado, L.F.L., 2010. First records of Fraser's Dolphin *Lagenodelphis hosei* for the Cape Verde Islands. *Zoologia Caboverdiana*. Available at: http://researchonline.jcu.edu.au/16949/1/Torda_et_al__Lagenodelphis.pdf.